IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A plasma processing apparatus comprising:

a first electrode;

a first power source operably connected to the first electrode;

a substrate configured to be subjected to a plasma, the substrate being positioned on the first electrode;

a magnetic field generator configured to apply a static magnetic field to a surface of the substrate to which the plasma process is applied;

a second power source; and

a disk-shaped auxiliary electrode provided on an outer periphery of said first electrode to excite the plasma in a vicinity of the auxiliary electrode, the auxiliary electrode having substantially planar front and back surfaces,

wherein the auxiliary electrode extends substantially parallel to a surface of the first electrode,

wherein the auxiliary electrode is operably connected to the second power source, and the front surface of said auxiliary electrode is covered by an insulating material, and the back surface of said auxiliary electrode is not covered by the insulating material, [[and]]

wherein said first electrode and said auxiliary electrode are supplied with radio frequency signals having different phases to establish a flow of electrons substantially parallel to the front surface of said auxiliary electrode and substantially parallel to the back surface thereof; and

wherein the surface of the substrate and the front surface of auxiliary electrode are within ± 2mm of each other.

2. (Cancelled).

3. (Previously Presented) The plasma processing apparatus as claimed in claim 1, wherein the substrate has a surface positioned at a level substantially equal to a level of the front surface of said auxiliary electrode.

4. (Previously Presented) The plasma processing apparatus as claimed in claim 1, wherein said magnetic field generator comprises a dipole ring magnet.

5. (Previously Presented) The plasma processing apparatus as claimed in claim 1, wherein said first electrode is supplied with a first radio frequency and said auxiliary electrode is supplied with a second radio frequency and wherein the first and the second radio frequencies are equal to each other and have different phases thereof.

6. (Previously Presented) The plasma processing apparatus as claimed in claim 1, wherein said first electrode is supplied with a first radio frequency and said auxiliary electrode is supplied with a second radio frequency and wherein said second radio frequency is higher than said first radio frequency.

7. (Currently Amended) A plasma processing method performed in a plasma processing apparatus comprising a first electrode on which a substrate is positioned, a first power source operably connected to the first electrode, an auxiliary electrode provided on an outer periphery of said first electrode, the auxiliary electrode having a front surface covered with an insulating material and a back surface not covered by the insulating material, and a second power source operably connected to the auxiliary electrode, the method comprising:

subjecting the substrate to a plasma process containing a plasma;

applying a static magnetic field to a surface of the substrate to which the plasma process is applied;

exciting plasma on at least a back surface of the auxiliary electrode; and

supplying radio frequency signals with different predetermined phases to the first electrode and the auxiliary electrode~~, thereby creating~~ to create a difference in plasma density between the front surface of the auxiliary electrode and the back surface of the auxiliary

electrode to cause electrons in the plasma to drift from the front surface of said auxiliary electrode to the back surface thereof and from the back surface of said auxiliary electrode to the front surface thereof, and to cause the electrons in the plasma to circulate substantially parallel to the front surface of the auxiliary electrode and substantially parallel to the back surface thereof.

8. (Currently Amended) A plasma processing apparatus comprising:

a first electrode;

a first power source operably connected to the first electrode;

a substrate configured to be subjected to a plasma, the substrate being positioned on the first electrode;

a magnetic field generator configured to apply a static magnetic field to a surface of the substrate to which the plasma process is applied;

a second power source; and

a disk-shaped auxiliary electrode provided on an outer periphery of said first electrode to excite the plasma in a vicinity of the auxiliary electrode, the auxiliary electrode having substantially planar front and back surfaces, the front surface of said auxiliary electrode being covered by an insulating material and the back surface of said auxiliary electrode not being covered by the insulating material such that a difference in plasma density is created between the front surface of the auxiliary electrode and the back surface of the auxiliary electrode,

wherein the auxiliary electrode is operably connected to the second power source, [[and]]

wherein electrons in the plasma drift from the front surface of said auxiliary electrode to the back surface thereof and from the back surface of said auxiliary electrode to the front surface thereof, and the electrons in the plasma circulate substantially parallel to the front surface of the auxiliary electrode and substantially parallel to the back surface thereof; and

wherein the surface of the substrate and the front surface of auxiliary electrode are within ± 2mm of each other.

9. (Currently Amended) A plasma processing apparatus comprising:

a first electrode;

a first power source operably connected to the first electrode;

a substrate configured to be subjected to a plasma, the substrate being positioned on the first electrode;

a magnetic field generator configured to apply a static magnetic field to a surface of the substrate to which the plasma process is applied;

a second power source; and

a disk-shaped auxiliary electrode provided on an outer periphery of said first electrode to excite plasma in a vicinity of the auxiliary electrode, the auxiliary electrode having substantially planar front and back surfaces,

wherein the auxiliary electrode is operably connected to the second power source, and

wherein electrons in the plasma drift from the front surface of said auxiliary electrode to the back surface thereof and from the back surface of said auxiliary electrode to the front surface thereof, and the electrons in the plasma circulate substantially parallel to the front surface of the auxiliary electrode and substantially parallel to the back surface thereof,

wherein the front surface of said auxiliary electrode is covered by an insulating material and the back surface of said auxiliary electrode is not covered by said insulting material such that a difference in plasma density is created between the front surface of the auxiliary electrode and the back surface of the auxiliary electrode; and

wherein the surface of the substrate and the front surface of auxiliary electrode are within ±2mm of each other.

10. (Currently Amended) A plasma processing apparatus comprising:

a first electrode;

a first power source operably connected to the first electrode;

a substrate configured to be subjected to a plasma, the substrate being positioned on the first electrode;

a magnetic field generator configured to apply a static magnetic field to a surface of the substrate to which the plasma process is applied;

a second power source; and

a disk-shaped auxiliary electrode provided on an outer periphery of said first electrode to excite plasma in a vicinity of the auxiliary electrode, the auxiliary electrode having substantially planar front and back surfaces,

wherein the auxiliary electrode is operably connected to the second power source, and the front surface of said auxiliary electrode is covered by an insulating material, and the back surface of said auxiliary electrode is not covered by the insulating material, and

wherein electrons in the plasma drift from the front surface of said auxiliary electrode to the back surface thereof and from the back surface of said auxiliary electrode to the front surface thereof, and the electrons in the plasma circulate substantially parallel to the front surface of the auxiliary electrode and substantially parallel to the back surface thereof,

wherein said first electrode is supplied with a first radio frequency and said auxiliary electrode is supplied with a second radio frequency and wherein the first and the second radio frequencies are equal to each other ~~and have~~ while having different predetermined phases ~~thereof~~.

11. (Cancelled)